TOMOLOGICAL
OCIETY OF
SH COLUMBIA

PROCEEDINGS

OF THE

ENTOMOLOGICAL SOCIETY

OF

BRITISH COLUMBIA

(INCORPORATED)

1928

NUMBER TWENTY-FIVE

Printed by
Murphy & Chapman, Ltd., 501 Seymour Street, Vancouver, B.C.

PROCEEDINGS

OF THE

ENTOMOLOGICAL SOCIETY

OF

BRITISH COLUMBIA

(INCORPORATED)

1928

NUMBER TWENTY-FIVE

Printed by

Murphy & Chapman, Ltd., 569 Seymour Street, Vancouver, B.C.

TABLE OF CONTENTS

Page

Report of the Secretary-Treasurer for the Year 1927 5

Financial Statement for the Year 1927 6

Presidential Address—*J. W. Winson* 7

Notes on the Ontario Society Meeting 9

Notes on some Orthoptera from the Peace River District of British Columbia—*E. R. Buckell* 10

On the Early Stages of Platyptilia Punctidactyla—*G. O. Day, F.E.S.* 14

Notes on Economic Insects on Vancouver Island in 1927—*W. Downes* 16

An Interesting Myzocallis—*R. Glendenning* 18

The Cabbage Root Maggot Attacking Carnations—*G. J. Spencer* 21

ENTOMOLOGICAL SOCIETY
of
BRITISH COLUMBIA

REPORT OF THE SECRETARY-TREASURER FOR THE YEAR 1927

I beg to submit the following report of the activities of the Society for the past year.

Finances

Our financial condition continues to be satisfactory as, after spending over $370.00 this year we still have a credit balance of $65.26 without any outstanding debts.

Membership

Our membership is now thirty-seven, a slight increase over last year. We have lost three members by resignation and one, Mr. Auden, by death. His passing is much to be regretted as he was a keen student of B.C. coleoptera.

Several new members have been gained through the full membership having been granted for $1.00 subscription.

Arrears of subscriptions this year amount to $26.00.

Proceedings

Number 24 of our Proceedings has been published, and contains some interesting and valuable contributions. The cost of printing amounted to $124.00.

Library

The library continues to grow. The Pan-Pacific Entomologist has been purchased and we now have the complete files since its inception in 1924.

Some hundred odd bulletins and pamphlets have been received during the year in the course of exchange of our Proceedings, and it will be necessary to revise our catalogue in the near future in consequence.

R. GLENDENNING
Hon. Secretary-Treasurer

Agassiz, B.C., February 23rd, 1928.

FINANCIAL STATEMENT FOR THE YEAR 1927

RECEIPTS		EXPENDITURES	
Balance from 1926	$120.67	Printing Proc No. 23	$120.25
Subscriptions	43.00	Printing Proc. No. 24	124.23
Sale of Proceedings	11.00	Printing prorammes	9.88
Bank Interest	4.10	Stamps	17.50
Prov. Govt. Grant	250.00	Express	3.43
Cheque Outstanding	9.88	Subsns. to periodicals	11.05
		Ontario Society dues	24.00
		Rent of meeting room 1927	10.00
		Secretary's honorarium	50.00
		Sundries	3.05
		Balance in Bank	65.26
	$438.65		$438.65

R. GLENDENNING
Hon. Secretary-Treasurer

Audited and found correct

J. W. EASTHAM
Hon. Auditor

PRESIDENTIAL ADDRESS

By J. W. Winson

A pleasing experience in our meetings held in Victoria is a more equable blending of the pacific Systematists with the militant Economists and therefore a more balanced conference. The Systematist, though not so much in the public eye as the Economist, is now seen to have been the prophet of a great science. That which began as a hobby has now become a crusade against a universal menace.

If people are turning to heed and to honor the Entomologist it is because they are becoming concerned for their own security.

Not only honor but fortune is now offered to the new champion. The Government of Egypt promise millions to the David or the Joseph that shall deliver the country from the worm in the cotton.

Wherever crops of vegetable or fruit are grown in large quantities there some pernicious insect foregathers. The story of St. George and the Dragon is revived, and the Entomologist is the George who is to do it.

So serious is the world-wide conquest that England has set up an Insect Arsenal or Entomological Zoo for research where parasites are bred and studied for dispersion against the insect hosts of the Empire.

Parasites that live on the enemy and then destroys him may be more efficient than chemicals, repellants and poisons.

But the uses of guile and subtlety in making attractive lures of poisons seems to be gaining ground, and a new avenue of destruction is opening up in this direction.

If the chemist can isolate for us the essential constituent which attracts certain insects to certain plants we can use that to draw them to their death. And also taking the constituent from a plant that is repellant we can use it to disguise the plant they enjoy. This may revolutionize certain lines of the work of the economic entomologist. The science is so new in practice that the future is full of interesting possibilities, yet one may allude to an entomological conjecture of the past which has great interest.

In the dim and distant geological ages the progenitor of the modern horse ran down this continent. The horse of today is a fairly recent immigrant brought here by man, because no wild horses were found before human occupation.

But in a vastly earlier epoch the little Eohippus or his relative came over from Asia by way of Alaska and this delectable province.

He spread down the continent, but not right down, and somewhere near the limits of his extension geologists have found fossil remains of the tsetse, eloquent evidence of the power of the insect in those prehistoric ages. An entomologist has stated recently that the Arabs could carry Mohammedism in Africa no further than the range of this fly which killed their horses, so that even religions and histories have been changed enormously for lack of efficient entomologists.

To come down to the present time and to our present concerns, your Society as a whole cannot but be grateful to those members who are crystallizing and correlating their studies into systematic lists. Some are already completed, others are in preparation. This is a praiseworthy work of benefit not only to ourselves, but to those who will follow us.

If not too presumptive I should like to suggest another endeavor. Many of you are specializing so much that you are becoming exclusive and lost to the rest of us and to mankind in general.. Of course the Annual Meeting corrects this isolation somewhat, but I think we are beginning to feel the need of some interpreting medium. For this I would suggest a bulletin made up by dipterists, coleopterists, lepidopterists and all other "ists" wherin each defines and explains his order, series or family as it relates to this Province and obtain Government assistance in publishing it to show the common people in a language they can understand, what is being done in this great work and how vital it is that the work and the interest be supported.

NOTES ON THE ONTARIO SOCIETY MEETING

I had the pleasure with several other British Columbia members of being present at the 64th Annual Meeting of our parent body in Ottawa in November, 1927.

Some 43 papers were presented, 35 being economic, 6 systematic and 2 general. Several distinguished Canadian and American entomologists were present and took part in the meeting, including Rev. Father Leopold, Prof. Caesar, Prof. E. M. Walker, Dr. L. O. Howard and Dr. Lutz.

Prof. A. W. Baker is the new president and Prof. Detweiler of the University of Western Ontario at London is now Vice-President.

The British Columbia Society members had full voting privileges and I might say that an interesting discussion took place on the form of the "Canadian Entomologist" precipitated by a motion that, as your secretary, I felt it my duty to bring up. It appeared to be the opinion of the majority at the meeting that the present form of the "Canadian Entomologist" was far from satisfactory, and a committee was appointed to consider what improvements could be incorporated. These recommendations were left in the hands of the chairman of the committee to be taken up with the Editor, Mr. McDunnough. So that there is every hope that we shall have a better "Canadian Entomologist" in the future.

One of the outstanding features of the meeting was the showing of several thousand feet of moving picture film depicting the habits of the two species of hymenoptera that are being reared at Chatham, Ontario, to combat the corn borer. This film was taken under the direction of Mr. Baird whom most of you will remember and was a marvellous exhibition of skill and patience, and is an immense improvement over any previous films of insects either in Canada or the States. The action of the inch long ovipositors in piercing the corn borer were beautifully and clearly shown.

It was generally conceded that the meeting was the most successful ever held, and part of this success can, I think, quite fairly be attributed to the presence of several of the members of the British Columbia Branch there.

—G.

NOTES ON SOME ORTHOPTERA FROM THE PEACE RIVER DISTRICT OF BRITISH COLUMBIA

By E. R. Buckell

Dominion Entomological Laboratory, Vernon, B.C.

It is not generally recognized that the Province of British Columbia contains a large area of prairie land lying to the east of the Rocky Mountains in the Peace River District. This northeastern corner of the province is approximately as large as the territory lying south of the main line of the Canadian Pacific Railway from the Alberta boundary near Banff to Vancouver, and Vancouver Island combined.

In this area adjoining Alberta, on latitude 56, lies the British Columbia Peace River Block containing 3,500,000 acres, where considerable settlement is taking place and some of the finest wheat and oats in North America can be grown.

The land within the British Columbia Peace River Block is gently rolling, with scattered patches of aspen, poplar and occasional areas of spruce and tamarack swamp, and is typical of the vast Peace River District, of Northwestern Alberta, of which geographically, it is a part. The mountains lie approximately one hundred miles to the west of the British Columbia Peace River Block.

The collection of orthoptera secured in 1927 from this region, as might be expected, does not contain many species, but is, nevertheless, of considerable interest, as it extends the northern known range of some of the species considerably and includes at least one new record for British Columbia.

The only other part of the Province, where collecting has been done, in which we frequently find prairie species and races, is the East Kootenay and Upper Columbia valleys, lying between the Rocky Mountains on the east and the Selkirks on the west. Here it is even more surprising to find prairie forms than it is in the Peace River District which is, geographically, the northwestern limit of the Great Plains with no intervening mountain chain. Certain similarities in the orthopterous forms of these two regions will be discussed further, when dealing with the species recorded from the Peace River Block, which are here enumerated. Most of the specimens were collected by P. N. Vroom.

Acrydium granulatum Kirby:—This grouse-locust was found commonly and specimens were collected at Pouce Coupe, Rolla, and Fort St. John. It occurs in Canada from the Atlantic to the Pacific.

Acrydium acadicum acadicum (Scudder):—There is a record of this species from Kaslo on the Kootenay Lake by A.N. Caudell, 1913, recorded

as **A. ornatum** (Say). This is the only previous record of this species from British Columbia. Three specimens were taken at Pouce Coupe and Rolla. It occurs fairly commonly from Alberta to Quebec.

Chloealtis conspersa (Harris):—The Peace River Block is an ideal location for this species which is particularly fond of inhabiting the coarse vegetation beneath aspen poplars, and in some warm, dry ravines was very numerous. The specimens secured were slightly smaller and darker than those collected in the Chilcotin District. It occurs locally throughout the province from the eastern slopes of the coast mountains to Alberta. Specimens were taken at Pouce Coupe and Rolla.

Chloealtis abdominalis (Thomas):—This species was taken at Rolla. It did not appear to be as common as **conspersa,** but is by far the commoner of the two species to the west of the mountains particularly in the southern interior.

Gomphocerus clavatus Thomas:—This was one of the most plentiful species in the Peace River Block and numerous specimens were taken at Pouce Coupe, Rolla, and Fort St. John.

This is a common species in Alberta and the Canadian prairies, and has been previously recorded from British Columbia only from the East Kootenay Valley in 1926, where it has evidently become established after making its way through some of the passes of the Rocky Mountain range. There are no records of it from west of the Selkirks.

Chorthippus curtipennis (Harris):—This is a common species in British Columbia, but to pick out typical specimens of either of its geographic races presents considerable difficulty. The majority of the material examined is either intermediate between **curtipennis curtipennis** (Harris) and **curtipennis oregonensis** (Scudder), or atypical, in more or less degree, of one or the other race.

Three males were collected at Pouce Coupe. These are decidedly small for the species and have the wings projecting slightly beyond the end of the abdomen. I would place them as a typical **curtipennis curtipennis** (Harris), the wings being too short for typical material. Typical specimens of **curtipennis curtipennis** (Harris), with the wings of the males projecting well beyond the end of their abdomens, have been collected in the Chilcotin district and at Penticton, Creston, and Cranbrook, but are not common.

Typical **curtipennis oregonensis** (Scudder) from Corvallis and Forest Grove, Oregon, has the wings in the male less than the combined length of the head and pronotum, reaching to about the middle of the abdomen. No specimens with such short wings have been recorded from British Columbia, but a fair number with wings falling just short of the tip of

the abdomen in the male, and with comparatively short antennae, have been collected in the Chilcotin District and at Barkerville, Anahim Lake, Rockcreek, and Cranbrook, and may be considered very nearly typical **curtipennis oregonensis** (Scudder).

Arphia frigida Scudder:—This species is found from Manitoba to Alberta and from the Northwest Territories to the Yukon and Alaska. In British Columbia it has been recorded from Telegraph Creek on latitude 58, from Pouce Coupe and Fort St. John in the Peace River Block, and from the East Kootenay and Upper Columbia valleys. There is also a questionable record from Victoria on Vancouver Island.

The specimens collected are all yellow-winged, rather dark in colouration, and lack the light yellow stripe down the centre of the closed tegmina, so conspicuous in some specimens. This is an early spring species hibernating in the nymph stage.

Camnula pellucida (Scudder):—This is the species of main economic importance in the Peace River Block and has, during the past few years, caused very serious damage to the grain crops. From 1923 to 1926 it was in outbreak form throughout the Peace River district of Alberta and British Columbia, and did enormous damage to the grain crops of the region. The cold, heavy rains in the spring of 1927 completely wiped out the young grasshoppers soon after hatching. Although enormous numbers hatched and great loss to the crops was anticipated, the mortality, from the weather conditions, was so complete that no damage was done and the species was quite scarce.

As is usual with the species, the dry, overgrazed road sides and worn out pastures were chosen for oviposition. This is one of the main injurious species in North America and occurs in Canada from the Atlantic to the Pacific. In British Columbia it has been found wherever collecting has been done.

Pardalophora apiculata (Harris):—This is another species occurring early in the spring. It is one of the largest of the British Columbia orthoptera, and decidedly rare west of the mountains, only a few specimens from the Chilcotin district having been found. In the Peace River Block it is apparently quite numerous and a good series was collected. It has been recorded in Canada from the Atlantic to the Pacific and north to the Northwest Territory. Specimens were taken at Pouce Coupe, Rolla, and Fort St. John.

Trimerotropis campestris McNeill:—A single specimen was secured on the banks of the Peace River near Rolla Landing and was the only specimen of this genus secured in the Peace River Block. This specimen had bright red hind tibiae similar to those from the prairies of Southern Alberta and from the East Kootenay and Upper Columbia Valleys. To the

west of the Selkirks, in the southern interior of British Columbia, the tibiae of this species are always yellow or yellowish-green. It is an extremely common species on the cattle ranges of the southern interior from the Nicola valley to the Chilcotin district.

Circotettix verruculatus (Kirby):—The specimens secured were typical **verruculatus,** which is an eastern species extending westward to the Rocky Mountains, and occurring very doubtfully to the west of the mountains where its place is taken by **Circotettix suffusus** (Scudder). It was found commonly on the banks of the Peace River near Rolla.

Aerochoreutes carlinianus carlinianus (Thomas):—Two specimens were secured in 1927, one at Rolla and one at Fort St. John. Both were captured on the dry open banks of the Peace River.

These specimens are typical **carlinianus carlinianus** (Thomas). This species is most plentiful in the Chilcotin district where we find the majority to be intermediate between **carlinianus carlinianus** (Thomas), and **carlinianus strepitus** Rehn. No typical **carlinianus strepitus** Rehn has as yet been taken in the province.

Melanoplus brunneri Scudder:—This was the chief species of **Melanoplus** found in this area, where it appears to replace **Melanoplus mexicanus atlanis** (Riley) which was not present. **Melanoplus mexicanus atlanis** (Riley) does not occur in any numbers north of the Chilcotin District and we find in the Bulkley Valley and northward it is replaced by **Melanoplus brunneri** Scudder. Considerable damage was done by this species in the Peace River Block during the recent grasshopper outbreak. Specimens were taken at Pouce Coupe, Rolla and Fort St. John.

Melanoplus dodgei huroni (Blatchley):—A good series of this species was secured, and it was quite plentiful in dry locations in the poplar woods. This is a northern species in British Columbia and becomes increasingly numerous from the Chilcotin District northward to the Nechako and Bulkley Valleys and throughout the Peace River country.

Melanoplus borealis monticola Scudder. This race of **borealis** was taken at Fort St. John in swampy bush land. The specimens taken were large and brightly coloured and similar in every way to those found in the interior of the province. **Melanoplus borealis borealis** (Fieber) has been taken in the coastal bogs at Prince Rupert and **Melanoplus borealis junius** (Dodge) at Anahim Lake in the northern Chilcotin district.

Melanoplus bivittatus (Say):—This is a very common species throughout Canada and is found in Brittish Columbia in all localities.

Specimens were seen at Fort St. John. All noted had bright blue hind tibiae, which is common to the prairie specimens. In the interior of British Columbia every shade of red and blue tibiae can be found, some being almost black.

Metrioptera sphagnorum (F. Walker):—This small, brightly coloured Decticid was very abundant in the Peace River country and the males could be heard stridulating amongst the low bushes and weeds on any warm day in August. No females were found. This is the first record of this species for British Columbia. It is plentiful in the Alberta foothills between Banff and Calgary. Specimens were collected at Pouce Coupe, Rolla, and Fort St. John.

Ceuthophilus sp:—A single species of the genus was taken in the Peace River Block. It was found commonly at Pouce Coupe and Rolla under logs and stones, and a large series was secure. Definite determination has not as yet been made.

ON THE EARLY STAGES OF PLATYPTILIA PUNCTIDACTYLA

(Pterophoridae-Lepid)

By G. O. Day, F.E.S.
Duncan, V.I., B.C.

I am taking the opportunity of this meeting of the British Columbia Entomological Society to answer a kind of challenge of Doctors Barnes and Lindsey in their "Monograph of the Pterophoridae of America, North of Mexico," where it is stated in regard to **Platyptilia pica** and **Platyptilia punctidactyla** that nothing is known of the early stages and that "an interesting and valuable piece of biological work for the entomologists of British Columbia lies in the breeding of these species."

I may mention that it was only in October, 1927 I found these remarks in Barnes' and Lindsey's work.

To hark back a bit, I may explain that for several years past, I had noticed that many of the seed capsules of one of our common spring flowers namely **Dodecatheon pauciflorum,** commonly called the Shooting Star, had small holes eaten into them, one hole in each capsule so attacked, and I always failed to find a caterpillar inside. However, in the spring of 1926 I was fortunate enough to find a larva outside the pod feeding with its head inside. With this guidance as to the habits of the

creature I paid more attention and secured some six or seven larvae and kept them under observation until they pupated.

The following are the notes that I made at the time:—

"19th May, 1926, found seed-heads of **Dodecatheon pauciflorum** with four larvae feeding on the green pods, the larvae outside with their heads inside feeding on the seeds. Shape of larvae; thickest in the middle, tapering considerably anteriorly and posteriorly. Colour: a soft grey green with a longitudinal rose coloured stripe from head to tail along the middle of the dorsal area. Two days later found a seed pod with a pupa attached, secured by the anal hooks and hanging downwards, apparently held in position by the somewhat sticky pubescence of the pod. Length: 8mm. Width: about 1.5 mm. Wing case: very distinct, the wings ending in two marked projections. Head: obliquely blunt."

There is a curious prolongation of the wing case underneath reaching nearly to the tail and shaped as shown below. (1)

1. 2.

The pupa is capable of bending the body quickly just below the wing covers and when in that position the prolongation of the wing case stands out distinctly. (2)

On further observation I found that the larva feeds also inside the capsule without showing any hole by which they entered.

They vary very much in ground colours, from emerald green to brown and rose, and in one case the dark rose became mottled. The moths emerged in the breeding cage about June 6th, 1926, apparently **P. punctidactyla.**

It is seen by an examination of the insects in the box I have brought that the specimens vary extensively, inter se, but they are mostly from the larvae found about the same time and about the same place. A rather interesting question arises therefore as to whether they represent varieties of one species or whether they can be differentiated into two species as at present accepted, namely **P. punctidactyla** and **P. pica ?**

It is my intention this year to collect as many of the larvae as possible and carefully note if they can be separated into two groups.

NOTES ON ECONOMIC INSECTS ON VANCOUVER ISLAND IN 1927

By W. Downes

Dominion Entomological Laboratory, Victoria, B.C.

The year 1927 was not marked by any severe insect outbreaks and many species ordinarily troublesome were conspicuous by their absence. Weather conditions were doubtless the cause of this in a great measure; the spring opened late with much cold and stormy weather and as the season advanced, lower temperatures than usual and increased rainfall became the rule, conditions which were not favorable to insect activity. Among fruit insects the currant fruit fly **(Epochra canadensis** Loew) was noticeably scarce, a rather unusual occurrence, as this pest seldom fails to do a large amount of damage. The strawberry root weevil **(Brachyrinus ovatus** L.) seemed to maintain its usual numbers. In this connection it may be of interest to mention that new formulae and improvements in the methods of making poisoned baits for these weevils are making this means of control cheaper and more practical, and may result in solving a very difficult problem. The European leafroller **(Cacoecia rosana** L.) was not quite as abundant as formerly. It is spreading slowly out into the country districts and is a major pest in many apple orchards. Three or four species of native parasites are now attacking this species with vigour and, ultimately, may greatly reduce its numbers.

The cherry fruit worm **(Grapholitha packardi** Zell.) again caused considerable damage to sour cherries. The trouble from this source has been more or less evident for a number of years, but of late has greatly increased, some growers losing as much as 30 per cent. of their crops each year for the past three seasons. The moth is a native insect allied to the lesser apple worm **(L. prunivora** Walsh) which it closely resembles in all stages, but is decidedly smaller. The life-history has been partly worked out. Eggs are deposited singly on the fruit early in June, and the larva lives around the pit, maturing before the fruit is ready for picking in July. Upon leaving the fruit they bore down the centre of a dead cherry twig, usually choosing the dead stubs where prunings have been taken off. They have also been found in crevices of the bark and in the centre of dead bracken stems. In this situation they remain during the fall and winter, and pupate in the spring, the adults emerging in May. The native host of this species has not yet been found.

The greater bulb fly **(Merodon equestris** F.) was scarce this year, but in most years it causes considerable loss to some bulb growers. The lesser bulb fly **(Eumerus strigatus** Fall) which is mainly a scavenger,

breeding in decaying bulbs already attacked by **Merodon** or by disease, was present in its usual numbers.

The cutworm (**Euxoa excellens** Grote) which usually is the source of much complaint was not much in evidence this year.

The parsnip webworm (**Depressaria heracliana** De Geer) appeared this year in large numbers and did a lot of damage in gardens by boring in the leaf stems of parsnips. It was also found abundantly in the stems of hemlock and wild parsnip growing on vacant lots.

The lilac leaf-miner (**Gracilaria syringella** Fab.) has now spread all over the city of Victoria and has been found also at Sidney.

The pine shoot moth (**Evetria buoliana** Schiff.) appears to have become established in this neighborhood, and last summer young pines, consisting of **Pinus mughus** and **Pinus densiflora nana** principally, were found heavily infested in a nursery outside Victoria. The larvae establish themselves in the centre of the terminal shoots causing serious injury to the trees. The work of the larvae distorts the young shoots which eventually die and a stunted branching growth appears below the injury. There are fortunately not many native pines in this district but if this insect became established in the interior it might cause serious damage.

The European earwig (**Forficula auricularia** Linn.) continues to spread and several new localities were discovered last summer in Victoria and Oak Bay.

In the latter district there are only two small areas at present and as poisoning operations will be carried out by the municipality every year it is hoped that they will be kept in check a long time. The new areas within the city were extensions of previous known areas which are comparatively small, but which must, as time goes on, slowly extend until the insect spreads over the entire city.

Another species of earwig (**Euborellia annulipes,** Lucas) was found last year to be established in numbers in Victoria in the gardens of the Empress Hotel. Its habits appear to be similar to those of the European earwig but whether it is capable of being equally destructive is not known. Numbers of them were caught under burlap bands that were placed on trees for collecting pupae of lacewing flies and also under pieces of board on the ground.

Considerable interest is attached to the occurrence of **Aphodius pardalis** Lec., a common scarabaeid beetle, as a pest of lawns at Powell River. During the years 1924, 1925 and 1926, serious damage was done by larvae of these beetles to the bowling green and golf greens at Powell River. The work of the larvae resembled that of the Asiatic beetle (**Anomala orientalis** Waterhouse) and it was thought at first that this was the species with which we had to deal. The sod was cut evenly

about three fourths of an inch below the surface as if it had been pared with a knife and it could be rolled up in patches like a mat. Habits of this nature have not hitherto been associated with the genus **Aphodius,** the members of which are nearly all scavengers, living on animal ordure, but this species appears to be an exception. Applications of carbon bisulphide emulsion in water had very little effect on the larvae and a reliable method of control has not yet been devised. The reason for the insect occurring in such destructive numbers is probably due to the fact that the sod of the greens in question provided the only suitable breeding ground for the beetles during the dry seasons. The surrounding country is denuded of bush and the almost barren soil supports only stunted berberis and salal and a few weeds. Such grassy spots as there are would become too dry for the larvae and the beetles would tend to concentrate upon the well-watered greens. This, at present, is the only explanation that seems to offer for the unusual destructiveness of this species.

Although not an insect, the symphylid, **Scutigerella immaculata** Newport, comes within our scope. This symphylid is about one third of an inch in length when full grown and pure white in colour. They move with great rapidity and are abundant in old fields and gardens where they normally live on decaying vegetable matter, but in spring are liable to be destructive to seedling plants of various kinds. Within the last few years many complaints have been received of damage to seedling mangels, the fields having to be re-seeded in many cases. The species occurs from British Columbia to California. No practical control, other than rotation of crops, has so far been suggested.

AN INTERESTING MYZOCALLIS

(Hemiptera, Aphididae)

By R. Glendenning

Dominion Entomological Laboratory, Agassiz, B.C.

In December, 1926, specimens of what I took to be **Myzocallis alnifoliae** Fitch were sent to Dr. W. M. Davidson at Vienna, Virginia. They were part of two collections, one from native alder **Alnus oregona** Nutt, and the other from wild strawberry, **Fragaria glauca** Wats, growing in close proximity at Agassiz.

As an alternate host for a member of the Callipterini is very unusual, especially in the case of such widely separated plants botanically as alder and strawberry, I wished to obtain confirmation of my determination

that the two aphids were of the same species. They were determined as conspecific by Dr. Davidson, but he pointed out to me that they did not agree entirely with **alnifoliae** Fitch, more especially in the arrangement of the sensoria on segment III. of the antenna and in the form of that segment, and considered that my specimens probably represented a new species.

Fortunately I refrained from rushing into print and with the publication of Volume 2 of Theobald's "Aphididae of Great Britain" I have been able to compare the species from alder and strawberry collected at Agassiz with the description and figures of **alni** De Geer (which also seems to be known as alni Fab), and these agree perfectly, with the exception that the dusky knee spot on the hind tibia is not mentioned.

The chief distinguishing features between **alni** and **alnifoliae** are that the latter is non-tuberculate, and the sensoria on segment III. of the antenna of the alate female are distributed in a row on the basal 2/3, while **alni** is tuberculate on the abdomen, and the sensoria on segment III. are bunched on the enlarged basal 1/3.

Myzocallis alni De Geer would appear to be a native here. It is widely spread and abundant annually in the lower Fraser Valley and causes much disfigurement each year on the alders.

The most interesting point, however, in connection with this species, is the habit of feeding on host plants so botanically distinct as alder and strawberry, an unusual proceeding for a member of the Callipterini. To obtain some data on this habit, in 1926 I potted some plants of the native strawberry and some young alders, and in 1927 endeavored to transfer to strawberry at various times during the summer individuals from alder both potted and from the field. I found it impossible, however, to maintain this aphid on strawberry for more than a day or two at a time, though when alder and strawberry plants were placed close together in the insectary, the lice would often leave the alder and go voluntarily to the strawberry but even then would not remain there for any length of time though they would feed readily.

In the field this aphid, both adult and nymph is found quite freely on strawberry when these plants are growing near alders, but not otherwise and it is interesting to note that Theobald has found in England that thyme, **Thymus Serpyllum** L and a species of **Epilobium,** when growing under alders are often infested with this species. I have examined other herbs growing under alders including **Solidago, Cnicus, Lathyrus** and various grasses but have not found any infestation on these plants.

Whether this habit of casual migration is the vestige of a regular double host habit, or the first step in the acquisition of this habit is

difficult to say, but the writer inclines strongly to the latter supposition from the position of this genus in aphid phylogeny.

The apterous oviparous females are produced on alder in the late fall, where the males are also found and several eggs are laid by each female in the axils of the leaf buds. The eggs when first laid are pea green in colour, later turning a shiny black. It was noticed that the oviparous females have two quite prominent wax pore areas on the ventral side of the abdomen just opposite the cornicles. From these areas thin filaments of wax, white and quite crisp, are extruded, and after egg laying, the females rub this wax on the still moist egg giving a frosted appearance to the otherwise shiny black surface. This may be a form of camouflage as the buds of the alder are slightly hoary also, and the eggs so covered, are possibly less easily seen by such birds as tits in their winter egg hunting excursions.

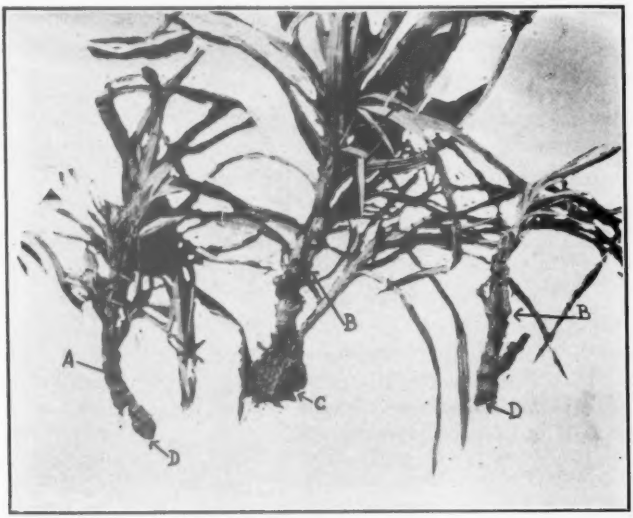
THE CABBAGE ROOT MAGGOT (**Hylemyia brassicae** Bouche) ATTACKING CARNATIONS

By G. J. Spencer
University of British Columbia

The last week in February, 1927, a bundle of carnation cuttings from New Westminster, was submitted to the Department of Zoology of the University with an enquiry as to the nature of certain insects which were injuring the stems.

The individual plants were from six to eight inches long, well formed, with thick stems and with sufficient masses of single roots to ensure healthy growth. The stems and in some cases the entire root system had been attacked by gnawing insects of some sort which were not present at the time.

Upon request, the grower forwarded a large bundle of plants a few days later, with the information that the greater part of his bed of cuttings had been destroyed. In these plants the injury consisted of tunnels up through the centre of the stem, involving, sometimes, the greater part of it, out to the periphery. In some cases, only the main part of the stem above the roots had been eaten away; in others, roots also had been destroyed. In a few cases the insect had practically bored out the carnation cutting leaving only a thin fringe of bark. In all cases the



THE CARNATION MAGGOT

A. shows normal stem. B.B. shows stem tunnelled and broken by maggots. C. shows normal young root system. D.D. shows root systems eaten off by maggots. (Reduced).

attack had destroyed the plant, even causing it to break and topple over at a point just above the level of the ground. Upon being repotted, none of the plants survived the injury.

From the second bundle of cuttings two typical Muscid or Anthomyid maggots were obtained which upon being placed in a cage, entered the soil immediately and by next day (March 5th) had pupated, two, and two and a half inches down, respectively. The cage was kept at usual laboratory temperature and was watered at intervals. The pupal period lasted practically one month and two female Anthomyid flies emerged on April 4th. Unfortunately these were the only two adults to be obtained as it was impossible for me to visit the scene of the infestation to collect more material.

The flies were sent to Mr. Gibson, Dominion Entomologist, who submitted them to Dr. Huckett of New York, an authority on Anthomyidae. Dr. Huckett considered them **Hylemyia brassicae** the common Cabbage Root Maggot and, in the absence of the male flies, this identification must stand. As Mr. Gibson says, this is a most unusual habit for this fly and constitutes a record. Unless further outbreaks occur, it must be considered as unique and of no menace to the growing of carnations in British Columbia.

The history of the outbreak is not known. The owner merely mentioned the fact that the carnations were of imported English stock. The infestation probably arose from flies emerging from pupae in soil which had been brought in from an old bed of cabbages infested by the root maggot. Normal host plants being absent, the flies must have laid their eggs around the carnation stems.

I am indebted to Mr. Olds of the Fumigation Station, for having visited the carnation grower in New Westminster for me and for bringing me the second lot of infested stems.

JANUARY, 1929—CORRECTION AND ADDENDA

At the International Congress of Entomology in August, 1928, at Ithaca, New York, I had the privilege of meeting Mr. F. W. Edwards, Dipterologist of the British Museum of Natural History, to whom I submitted this carnation maggot problem. He stated that the fly was unquestionably **Hylemyia brunescens** Zitterstedt which is a not uncommon pest of carnations in England.

This infestation therefore constitutes a record of a pest new to Canada and it was with this fear that Mr. Olds and I, at the time of discovery of the outbreak, impressed the grower with the possible seriousness of the situation, and he destroyed all his infested stock.

Up to the present (January, 1929) none of the main growers around Vancouver whom I have interrogated, have had similar trouble nor has a recurrence of the pest occurred in the original owner's garden.

CORRECTIONS

The following corrections apply to the paper "A List of Mosquitos of British Columbia," by E. Hearle appearing in No. 24 of these Proceedings.

On page 15, line 29, for **Aedes inequitus,** read **Aedes increpitus.**

On page 17, the following note regarding **Anopheles quadrimaculatus** should be added. The records of **Anopheles quadrimaculatus** Say given are from female specimens. They have the typical colouration of this species, and lack the bronzy patch at the apex of the wing that is characteristic of **Anopheles maculipennis.** It should be noted, however, that Freeborn (1923) states that in California this bronzy patch is very often indistinct. (Freeborn, S. B. Bull: Brooklyn Ent. Soc. Vol. XVIII., No. 5, p. 157, 1923).